

REMARKS

Applicants acknowledge receipt the supplemental Office Action, dated June 11, 2003 (Paper No. 12) revising and clarifying the Office Action of March 21, 2003 (Paper No. 11). The June 11, 2003 Office Action was taken in response to a telephone inquiry to the Examiner on June 3, 2003 by Richard Niehuser, (Reg. No. 44,260), with the office of Attorney for Applicants.

The supplemental Office Action clarifies that Claims 2-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Office Action Summary sheet of the Office Action of March 21, 2003 indicated that Claims 2-4 were rejected, although no particularized basis for the rejection of Claims 2-4 was set forth in the Detailed Action section of the March 21, 2003 Office Action.

The sections below are numbered to correspond with the section numbering used by the Examiner in the Office Action.

4. Claims 1 and 6-12 are novel over Sasano

The Examiner states:

Pertaining to claim 1, Sasano discloses a semiconductor process as claimed. See FIG. 1 where Sasano discloses a method comprising:
forming a central aperture in a substrate 1;
forming electrically conductive trace 6 on a first surface of said substrate, said trace comprising a tab (area 4); and
supporting an image sensor 6 in said central aperture by said tab.

(Office Action, Pages 2 and 3, **bold** and underline emphasis in original, *italic* emphasis added).

The Examiner's statement is respectfully traversed.

With regard to FIG. 1 cited by the Examiner, Sasano teaches:

... In the drawings, numeral 1 represents a package body Numeral 2 represents a recess of the package body 1, numeral 3 represents the inner bottom of the recess as a solid-state image device bonding area, and numeral 4 represents a step of the recess 2.

... Numeral 6 represents leads formed on the surface of the package body

... Numeral 7 represents a solid-state image device, ... mounted on the inner bottom of the package body 1 by die bonding. ... Numeral 9 represents a transparent sealing plate composed of glass, which is bonded onto the upper surface of the package body 1 with an adhesive 10

(Col. 5, lines 22-60, emphasis added)

Applicants first note that the Examiner's statement citing "an image sensor 6", is at variance with the teachings of Sasano set forth above that "Numeral 6 represents leads formed on the surface of the package body" and that "Numeral 7 represents a solid-state image device". Applicants assume that, in rejecting Claim 1, when referring to "an image sensor 6", the Examiner means "an image sensor 7".

With reference to FIG. 3G, Sasano again teaches that:

... a solid-state image device 7 is mounted on the inner bottom 3 of the package body 1,

(Col. 6, lines 60 and 61, emphasis added)

Thus, according to the teaching of Sasano above, "image sensor 7" is mounted on the inner bottom 3 of recess 2 of package body 1 by die bonding rather than supported by "tab (area 4)" in "a central aperture in a substrate 1", as asserted by the Examiner.

Accordingly, Applicants respectfully submit that the Examiner has failed to call out where Sasano discloses, teaches, or suggests a method comprising:

forming a central aperture in a substrate;

forming an electrically conductive trace on a first surface of said substrate, said trace comprising a tab; and supporting an image sensor in said central aperture by said tab,

as recited in Claim 1, emphasis added.

In addition, Claims 6-12 depend from Claim 1 and are therefore allowable for at least the same reasons as Claim 1.

For the above reasons, Applicants respectfully request reconsideration and withdrawal of this rejection.

13/14. Claim 5 is patentable over Sasano in view of Peterson et al.

As shown above, Claim 1 is allowable over Sasano. Claim 5, which depends from Claim 1, is allowable over Sasano for at least the same reason as Claim 1. Peterson et al. does not cure the deficiency in Sasano. Accordingly, Claim 5 is allowable over Sasano in view of Peterson et al.

In addition, with reference to Claim 5, the Examiner states:

Pertaining to claim 5, Sasano fails to teach the method of claim 1 wherein said supporting comprises **flip chip mounting said image sensor to said tab.** Peterson teaches flip chip mounting an image sensor. In view of Peterson, it would have been obvious to one of ordinary skill in the art to **incorporate the flip chip mounting** of an image device in the Sasano semiconductor process **because the light-sensitive side is optically accessible through the window** (see Abstract, 3rd sentence).

(Office Action Page 4, underline emphasis in original, **bold** emphasis added).

The Examiner's statement is respectfully traversed.

Peterson et al. sets forth:

... In flip-chip mounting **the chip is mounted face-down** and then reflow soldered using small solder balls or "bumps" to a **substrate having a matching pattern of circuit traces** (such as a printed wiring board)

(Col. 2, lines 43-47, emphasis added)

Contrary to the Examiner's assertion, in the flip-chip mounting configuration of Peterson et al., the light sensitive side of "image sensor 7" would be pointing face-down at inner bottom 3 of the recess 2 away from, and optically inaccessible to, the glass transparent sealing plate 9 bonded onto the upper surface of "substrate 1" of Sasano.

Flip chip mounting of "image sensor 7" on "tab (area 4)" would render the package of Sasano unsatisfactory for its intended purpose of housing a light receiving/emitting device, thereby negating any suggestion or motivation to make the mounting modification suggested by the Examiner.

Accordingly, one of ordinary skill in the art would not substitute Sasano's die bond mounting of "image sensor 7" at inner bottom 3 of recess 2, with the flip-chip mounting of Peterson et al. at "tab (area 4)".

For at least these reasons, Applicants respectfully submit that Sasano in view of Peterson et al. does not disclose, teach, or suggest:

... wherein said supporting **comprises flip chip mounting** said image sensor to said tab,

as recited in Claim 5, emphasis added.

Objections

The Examiner states:

Claims 2, 3 and 4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (Office Action, page 4.)

As set forth above, Claim 1 is allowable. Accordingly, Applicants respectfully submit that that Claims 2-4, which depend from Claim 1, are not dependent of a rejected base claim and are allowable for at least the same reasons as Claim 1.

For the above reasons, Applicants respectfully request reconsideration and withdrawal of this objection.

Allowable Subject Matter

Applicants note that Claims 13-21 are allowed in the Office Action.

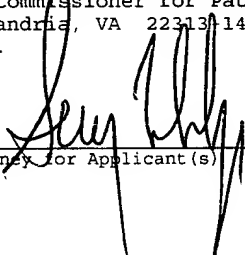
CONCLUSION

Claims 1-21 are pending in the application. For the foregoing reasons, Applicants respectfully request allowance of all pending claims.

If the Examiner has any questions relating to the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicants.

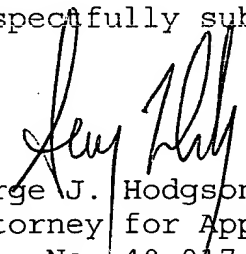
CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 19, 2003.


Attorney for Applicant(s)

June 19, 2003
Date of Signature

Respectfully submitted,


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